Access and Use of Services

Income Inequality and Health: Pathways and Mechanisms

Ichiro Kawachi and Bruce P. Kennedy

Abstract. The relationship between income and health is well established: the higher an individual's income, the better his or her health. However, recent research suggests that health may also be affected by the distribution of income within society. We outline the potential mechanisms underlying the so-called relative income hypothesis, which predicts that an individual's health status is better in societies with a more equal distribution of incomes. The effects of income inequality on health may be mediated by underinvestment in social goods, such as public education and health care; disruption of social cohesion and the erosion of social capital; and the harmful psychosocial effects of invidious social comparisons.

Key Words. Social inequality, socioeconomic status, relative deprivation, social capital

BACKGROUND

Despite being the richest nation in the world, and despite nearly a decade of sustained economic growth, the United States lags behind other developed countries on many health indicators. For instance, according to the 1996 United Nations Development Report, the United States was 20th in the world ranking of life expectancy, lagging behind poorer countries such as Costa Rica, Greece, and Spain (United Nations Development Program 1996). Although lack of access to universal health care undoubtedly contributes to the poor health achievement of this country, growing evidence suggests that broader economic forces may determine population patterns of health. Specifically, a novel hypothesis suggests that the extent of income inequality in society determines its average health status: the greater the gap between the incomes of the rich and poor, the worse the health status of citizens (Wilkinson 1996). In a cross-sectional examination of nine member countries of the Organization for Economic Cooperation and Development (OECD), Wilkinson (1992) reported a strong correlation ($r = 0.86$, $p < .001$) between

life expectancy and income inequality, as measured by the proportion of aggregate income earned by the least well of 70 percent of the population.

If valid, the income inequality hypothesis could have important implications for the health status of Americans. The United States currently leads the industrialized world in terms of the extent of income inequality, and the gap is growing (Atkinson, Rainwater, and Smeeding 1995). Inequalities in the distribution of wealth are especially severe: the best-off one percent of the American population owns between 40 and 50 percent of the nations' wealth (Wolff 1995; Hacker 1997).

In 1996, two simultaneously published studies reported that income inequality was linked to the health status of Americans. Kaplan et al. (1996) and Kennedy, Kawachi, and Prothrow-Stith (1996) independently examined the relationship between the degree of household income inequality across the 50 U.S. states and state-level variation in all-cause and cause-specific mortality. Kaplan et al. (1996) used as their measure of income distribution the share of total income earned by the bottom 50 percent of households in each state. If incomes were perfectly equally shared, the bottom half of households should account for exactly half of the aggregate income. In reality, the income shares across states ranged from a low of 17.5 percent (Louisiana, the most unequal) to a high of 23.6 percent (New Hampshire, the most egalitarian). A strong correlation ($r = -0.62$, $p < .001$) was found between this measure of inequality and age-standardized mortality rates; this correlation was present in both men and women, and in whites as well as African Americans. Kennedy, Kawachi, and Prothrow-Stith (1996) and Kawachi and Kennedy (1997a) examined a variety of other measures of income inequality and found substantially similar results. In regression models adjusting for poverty rates and median income, a one percent increase in inequality (measured in terms of the so-called "Robin Hood Index") was associated with an excess mortality of 21.7 deaths per 100,000 (95% CI, 6.6–36.7), suggesting that even a modest reduction in inequality could have an important effect on public health. Income inequality was associated not only with higher rates of total mortality, but also with higher rates of death from coronary heart disease, malignant neoplasms,

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homicide, and infant mortality. Income inequality and poverty together could account for about one-quarter of the state variations in total mortality, as well as just over half of the variation in homicide rates.

Ecologic associations are frequently criticized for being susceptible to the ecologic fallacy; that is, associations observed at the aggregate level may not be valid at the individual level (Kawachi et al. 1994; Gravelle 1998). In particular, it is difficult to disentangle the effects of absolute deprivation (i.e., poverty) from the effects of relative deprivation (income inequality). In other words, a correlation between income inequality and population mortality may simply reflect the well-documented effects of poverty on excess mortality (Hahn et al. 1996) and the fact that a higher concentration of poor individuals reside in high-inequality states. This type of effect cannot be ruled out by adjusting for the population prevalence of poverty in ecological analyses.

In order to address this issue, a multi-level analysis is needed, in which data on the incomes of individuals are available at the same time as ecologic data are available on the distribution of incomes within the geographic localities where the individuals reside. Three recent studies have examined the association between income inequality and health, using multi-level methods (Fiscella and Franks 1997; Daly et al. 1998; Kennedy et al. 1998).

MULTI-LEVEL STUDIES OF INCOME INEQUALITY AND HEALTH

Fiscella and Franks (1997) examined the relationship between income inequality and individual risk of mortality within the first National Health and Nutrition Examination Survey (NHANES I). The study followed a nationally representative sample of 14,407 subjects ages 25–74 from 1971–1975 until 1987. The authors found that income inequality at the county level was correlated with population rates of mortality ($r = -0.34$, $p = .004$); however, when community income inequality was examined simultaneously with family income, the relationship of income inequality to individual risk of death disappeared ($p = .75$); meanwhile family income remained powerfully predictive of mortality risk ($p < .001$). These results therefore suggested that the ecologic-level relationship of income inequality to mortality could be entirely explained by the relationship of individual income to health. The study had some important limitations, however. For instance, the measure of community income inequality was not derived from census data but was generated from the study subjects themselves, leading to the possibility of significant bias or measurement error (Kennedy et al. 1998).

More recently, Daly et al. (1998) examined the income inequality hypothesis within the Panel Study for Income Dynamics (PSID) for the years 1978–1982 and 1988–1992. In this study, state-level income inequality measures were related to the five-year, age-adjusted mortality risk of individuals aged 25 years and older. The analyses were based on a relatively small number of deaths ($N = 716$). When individual mortality risk was regressed on state-level income inequality, greater inequality was consistently associated with increased mortality risk, but the effect sizes were small and not statistically significant. Simultaneously adjusting for family income did not alter these findings. However, when the authors examined the effects of income inequality across different population subgroups, they found that inequality had statistically significant detrimental effects on mortality risk among non-elderly (ages 25–64), middle-income individuals, even after adjustment for family income. The authors examined a variety of approaches to measuring income inequality and found that those tapping the depths of relative poverty among the state's poor were more closely related to mortality risk than those measuring the heights of affluence (Daly et al. 1998).

Finally, Kennedy et al. (1998) examined the relationship between state-level income inequality and individual self-rated health within the 1993 and 1994 Behavioral Risk Factor Surveillance System (BRFSS) surveys. The BRFSS is a state-representative, random-digit-dial telephone survey of U.S. residents (Center for Disease Control and Prevention [CDC] 1997). In 1993, the BRFSS began asking a question about perceived general health (Hagan Hennessy et al. 1994): "Would you say that in general your health is Excellent, Very Good, Good, Fair, or Poor?" A review of 27 community studies concluded that even such a simple global assessment appears to have high predictive validity for mortality, independent of other medical or behavioral risk factors (Idler and Benyamini 1997). Self-rated health has also been demonstrated in longitudinal studies to predict the onset of disability (Ferraro, Farmer, and Wybraniec 1997; Idler and Kasl 1995; Mor et al. 1989; Wilcox, Kasl, and Idler 1996; Farmer and Ferraro 1997). The authors created a dichotomous outcome measure (1 = fair or poor; 0 = excellent, very good, or good), as done in previous studies (Idler and Benyamini 1997).

The strengths of the study included its large sample size ($N = 205{,}245$ individuals residing in 50 states), as well as the wealth of covariate information on individuals, including race, gender, household income, educational attainment, health insurance coverage, smoking status, body mass index, and recent history of a health check-up. The multi-level analyses adjusted for all

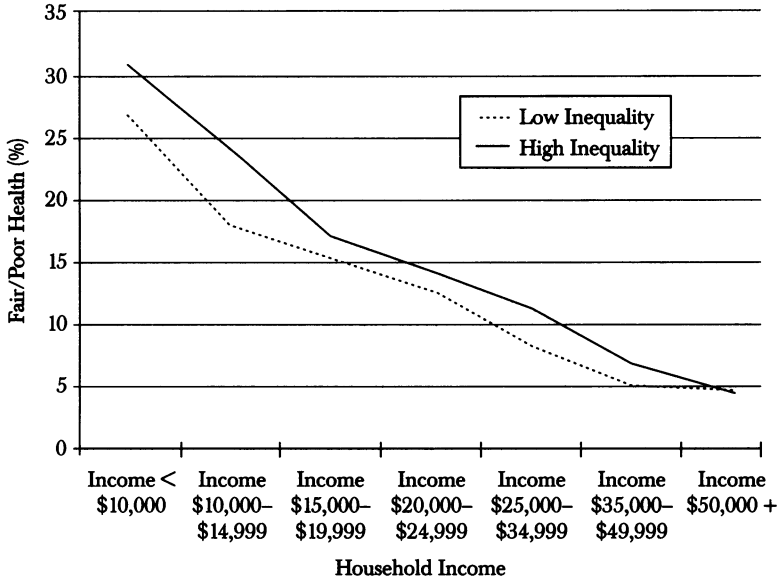
of these covariates (Kennedy et al. 1998). Data on income inequality at the state level were obtained from the Luxembourg Income Study (Atkinson, Rainwater, and Smeeding 1995). Gini coefficients of household income were adjusted for state differences in taxes and cash transfers, as well as differences in household composition using an equivalence scale (Kawachi and Kennedy 1997a). Each individual in the BRFSS sample was then assigned a contextual Gini value, according to their state of residence.

The results of the multi-level analysis indicated a modest, but statistically significant, deleterious effect of income inequality on self-rated health. Residents in the most unequal states had an adjusted odds ratio of reporting fair-poor health (as opposed to good-excellent health) of 1.25 (95% CI, 1.17–1.33), compared to residents in the most egalitarian states. Strong associations were also found between low household income and self-rated health (odds ratio = 3.40, comparing individuals earning less than $10,000 to those earning more than $35,000). As well, health insurance coverage was associated with a significantly lower odds of reporting fair-poor health (odds ratio, 0.79), although this finding could have resulted from poor health leading to loss of insurance coverage.

When the analyses were stratified by individual household income level, the deleterious effects of inequality were most evident among individuals with the lowest income (multivariate adjusted odds ratio of fair-poor health, 1.33; 95% CI, 1.22–1.45, comparing the highest to lowest inequality states within strata of individuals earning less than $20,000 per year). The contextual effect of income inequality on individual health can be clearly seen on Figure 1, which shows the upward shift in the income/poor health gradient that occurs among individuals residing in high inequality states. Income inequality did not appear to affect the self-rated health of individuals in the highest-income category (more than $50,000), although this may be an artifact of the underrepresentation of such individuals in the study sample.

In summary, three published multi-level studies to date have examined the relationship between income inequality and individual health, with somewhat mixed results. Two of the three studies (Daly et al. 1998; Kennedy et al. 1998) have found evidence in support of a residual, contextual effect of income inequality on health, even after taking account of the relationship between individual-level income and health. Further studies are warranted in this field, but the research and discussions of policy implications are unlikely to advance without a conceptual framework for the pathways and mechanisms underlying the relationship between income inequality and health.

Figure 1: Relationships of Self-rated Health (Percentage Reporting only Fair/Poor Health), According to Levels of Individual Income and Levels of Income Inequality (Thick line is the plot for high inequality states; thin line is the plot for low inequality states.)



PATHWAYS AND MECHANISMS LINKING INCOME INEQUALITY AND HEALTH

The finding of a link between income inequality and health begs the question of the mechanisms by which this association operates. At least three plausible mechanisms have been suggested (Kawachi et al. 1994; Lynch and Kaplan 1997): (a) that income inequality is linked to disinvestment in human capital; (b) that income inequality leads to the erosion of social capital; and (c) that income inequality leads directly to ill health via stressful social comparisons. Evidence exists to support each of these pathways.

Income Inequality and Disinvestment in Human Capital

Kaplan and colleagues (1996) have demonstrated striking correlations between the degree of income inequality at the state level and indicators of

human capital investment. States with high income inequality (as measured by the proportion of total household income received by the less well of 50 percent) spent a smaller proportion of the state budget on education and showed poorer educational outcomes, ranging from worse reading and mathematics proficiency to higher high school dropout rates. One reason why high income disparity may translate into lower social spending is that in societies with rising inequalities, the interests of the rich begin to diverge from those of the typical family. As Paul Krugman put it: "A family at the 95th percentile pays a lot more in taxes than a family at the 50th, but it does not receive a correspondingly higher benefit from public services, such as education. The greater the income gap, the greater the disparity in interests. This translates, because of the clout of the elite, into a constant pressure for lower taxes and reduced public services" (Krugman 1996:48). Reduced social spending, including educational spending, translates into diminished life opportunities for the poor to improve their material circumstances.

Income Inequality and the Erosion of Social Capital

A second pathway through which income inequality may affect health is via the disruption of the social fabric, or the erosion of what has been termed "social capital" (Kawachi and Kennedy 1997b; Wilkinson 1996). Social capital has been defined as those features of social organization—such as the extent of interpersonal trust between citizens, norms of reciprocity, and vibrancy of civic associations—that facilitate cooperation for mutual benefit (Coleman 1990; Putnam 1993; Kawachi and Kennedy 1997b). It has been claimed that social capital in important for the enhancement of government performance and the functioning of democracy (Putnam 1993); for the prevention of crime and delinquency (Sampson and Groves 1989; Kennedy et al. 1998; Sampson et al. 1997); and, more recently, for the maintenance of population health (Kawachi et al. 1997). Using U.S. data aggregated at the state level, Kawachi et al. (1997) reported strong cross-sectional correlations between indicators of social capital and mortality rates. In that study, social capital (or the lack of it) was measured by responses to the General Social Surveys about the degree of mistrust (the percentage of survey respondents in each state answering that "most people can't be trusted"); levels of perceived reciprocity (percentage of respondents replying that "most people look out for themselves"); and the per capita membership in voluntary assocations of all kinds. Each indicator of social capital was strikingly correlated with lower mortality rates ($r = 0.79$, 0.71, and -0.49, respectively), even after adjustment for state median income and poverty rates (Kawachi et al. 1997).

Turning to the problem of explaining the health effects of income inequality, it has been hypothesized that the widening of the social distance between the "haves" and "have-nots" has led to latent social conflict and increasing levels of mistrust between members of society. Kawachi and colleagues (1997) tested the association between income inequality and social cohesion at the ecological level. Using the same indicators of social capital just described, they demonstrated that citiens living in states characterized by high income disparities tend to be more mistrustful of each other ($r = 0.71$) and to belong to fewer civic associations ($r = -0.41$).

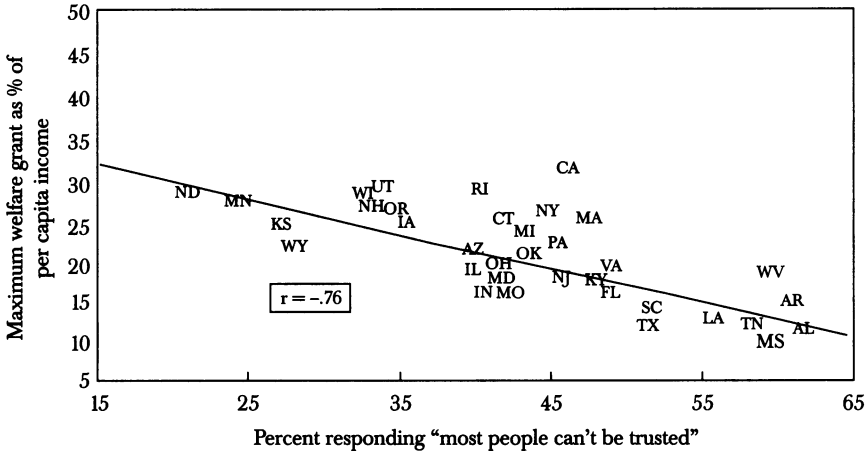
In turn, one of the mechanisms through which the erosion of social capital affects health seems to be via inegalitarian patterns of political participation, and the passage of social policies that are detrimental to the poor. Thus, Putnam (1993) has claimed that social capital is a critical ingredient for the functioning of democratic institutions. Low levels of interpersonal trust occur together with low levels of trust and confidence in public institutions (Brehm and Rahn 1997); low levels of political participation, as measured by voting and other forms of engagement in politics (Kawachi and Kennedy 1997b), and ultimately, reduced efficacy of government institutions (Putnam 1993). U.S. data demonstrate that states with low levels of interpersonal trust tend to be characterized by lower voter turnout at elections ($r = -0.49$, $p < .05$) (Kawachi and Kennedy 1997b), and moreover that such states are less likely to invest in policies that ensure the security of the most vulnerable segments of society. For example, civic mistrust at the state level was highly inversely correlated ($r = -0.76$) with the maximum welfare assistance as a percentage of per capita income in each state (Figure 2). Less generous states in turn are likely to provide less hospitable environments for the poor and disenfranchised.

Income Inequality and the Theory of Social Comparison

A final pathway linking income inequality to health is via the direct psychosocial effects of social comparisons. A long tradition of research in sociology points to the effects of relative deprivation on levels of frustration. In studies conducted in the U.S. military during the 1940s (Stouffer et al. 1949; Merton and Rossi 1950), morale was observed to be higher among officers in the military police, where promotion was very slow, compared to that of officers in the Air Force, where promotion was very rapid and, consequently, there was more exposure to invidious social comparisons.

The economist Juliet Schor (1998) describes how widening inequality in American society has given rise to a culture of upward social comparisons

Figure 2: Scatterplot of Maximum Welfare Grant Provided (Expressed as a Percentage of per Capita Income in Each State), According to Levels of Civic Mistrust



(and the attendant frustration of aspirations). For instance, in public opinion polls conducted back in 1978, $19,600 (or $1,960 more than the median family income) was thought to be necessary for "reasonable comfort." In 1985, the level of reasonable comfort had risen to $30,600 (compared to the median family income of $27,734). By 1994, the reasonable-comfort level had risen still further to $40,000 (Schor 1998). Nearly every American household responded that its income was insufficient "to afford to buy everything I really need," even the household that earned well above the median income.

Do social comparisons and frustrated expectations have adverse health consequences? Dressler has conducted a series of anthropological and epidemiological investigations addressing this question (Dressler 1996, 1998; Dressler, Balieiro, and Dos Santos 1998). Using a technique in anthropology called "cultural consensus analysis," which involves interviewing key informants, Dressler (1996) has established that many communities have a single, shared cultural model of the acceptable standard of living in such communities. For example, the acceptable standard of living in a rural U.S. African American community is defined by a set of lifestyle items such as ownership of a house and car, access to media via TV and newspapers, and socially specific items such as holding a position of leadership within the local church. Individuals strive to adopt material styles of life that are considered

customary for their community. Moreover, the "customary" standard of living turns out not to be one characterized by "conspicuous consumption," but more by what Veblen termed a "community defined standard of decency" (Veblen 1918). Dressler coined the term "cultural consonance in lifestyle" to refer to the degree to which individuals succeed in achieving the cultural model of lifestyle. To the extent that individuals strive and fail to meet the cultural ideal, there are adverse health effects. In studies conducted in the United States (1998a) and Brazil (1996), Dressler has demonstrated that the extent of departure from cultural consonance is the strongest predictor of systolic blood pressure (SBP), even after adjusting for other risk factors including skin color, obesity, occupation, education, and income.

A Note on the Unit of Analysis

The variety of pathways through which income inequality may affect health means that future research should be carried out at different units of geographical aggregation. It makes sense to investigate some of the pathways—such as inequalities in political participation—at the level of the states or of countries. On the other hand, pathways involving social capital and psychosocial effects could be examined more powerfully at the level of counties, cities, or neighborhoods. A recent study showed that income inequality is related to mortality rates at the level of metropolitan areas in the United States (Lynch et al. 1998).

CONCLUSION AND POLICY IMPLICATIONS

Beyond well-established determinants of well-being, such as access to affordable and effective health care, emerging evidence suggests that policymakers should pay attention to broader economic forces in order to improve the nation's health. The policy levers to reduce income inequality already exist, such as raising the minimum wage, increasing child care credits, and expanding the earned income tax credit (EITC). These policies have been tried to some extent already, but the case could be made that they have not been carried far enough to affect recent trends in income inequality. Importantly, these policies could reduce the extent of inequality in this country (already the highest of any industrialized nation) without increasing the risks of social pathologies (such as "welfare dependence") for which the welfare state has been blamed. The deleterious consequences of inequality are not borne

by the poor alone: everyone pays for the costs of increased sickness and crime, as well as for the diminished quality of civic institutions and the social environment.

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